

REMARKS

Claims 21-40 are presently pending.

The issues outstanding in this application are as follows:

- Claims 22-25 and 33-38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sheppard, Jr et al (US 6,143, 247) in view of Mian et al. (US 6,319,469) and Cathey et al. (US 5,660,993).
- Claims 21, 26 and 29-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sheppard, Jr et al (US 6,143, 247) in view of Mian et al. (US 6,319,469) and Cathey et al. (US 5,660,993) taken further in view of Chen et al. (US 5,800,778).
- Claims 27 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sheppard, Jr et al (US 6,143, 247) in view of Mian et al. (US 6,319,469), and Chen et al. (US 5,800,778) taken further in view of Wolfe et al. (US 5,190,879).
- Claims 39 and 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sheppard, Jr et al (US 6,143, 247) in view of Mian et al. (US 6,319,469), and Cathey et al. (US 5,660,993) taken further in view of Cook (WO9426413).

Applicants respectfully traverse the outstanding rejections, and Applicants respectfully request reconsideration and withdrawal thereof in light of the amendments and remarks contained herein.

A. Claim 20, 22-26, 31, 33, 36, and 42-47

Claims 22-25 and 33-38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sheppard, Jr et al (US 6,143, 247) in view of Mian et al. (US 6,319,469) and Cathey et al. (US 5,660,993).

To establish a *prima facie* case of obviousness, all limitations of a claim must be taught or suggested by cited prior art or, possibly, general knowledge in the art. MPEP §

2143.03. The Examiner attempts to supply the “hydrophobic valve” limitation in claim 22 from Cathey (col. 5, lines 47-60). Cathey discloses and uses capillary valves. (col. 5, lines 56-60; col. 7, lines 32-35; col. 10, lines 51-52; col. 11, lines 29-30; col. 12, lines 13-15.) Cathey does not teach or disclose hydrophobic valves, but rather the use of hydrophobic and hydrophilic areas in a channel to direct fluid flow patterns. The Examiner implicitly acknowledges this when the Examiner states, “a capillary valve and localized region hydrophobicity are art recognized equivalents for enhancing or controlling the flow of fluids...” The particular capillary valve of Cathey is based on the presence of a crossing microconduit at the valve position and is, as with all other capillary valves, a stop-flow valve. Above a certain driving pressure there is flow and below there is no flow. Once above this borderline pressure, a further increase in driving pressure will enhance flow. Once below this borderline pressure, a further decrease will do nothing. The hydrophobic areas of Cathey, in conjunction with hydrophilic areas, combine to impede or enhance fluid flow, respectively, through a device, thereby directing fluid flow over the inner surfaces. The hydrophobic and hydrophilic areas in Cathey’s device do not provide capillary valve function. To impede or enhance flow refers to ongoing flow and has nothing to do with stopping/starting flow as in a capillary valve. Controlling flow direction and stopping/initiating flow are not the same thing. Thus, the hydrophobic valve of the pending claims is not taught or suggested.

The Examiner erroneously concludes that the hydrophobic regions used for directional flow control in Cathey are the same as the hydrophobic regions used as flow stop/start valves in the pending claims. This is likely because Cathey discusses both directional flow control by hydrophobic regions and Cathey’s particular capillary stop/flow valve in the same paragraph. The Examiner then relies on this erroneous conclusion to support the further argument that the hydrophobic stop/start valves of the pending claims and the various stop/start valves disclosed by Sheppard and Mian are art recognized equivalents. This would establish the motivation to combine Cathey with Sheppard and Mian. MPEP § 2144.06. “In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant’s disclosure or the mere fact that the components at issue are functional or mechanical equivalents.” *Id.* Mian and Sheppard disclose mechanical, electrical, thermal and capillary

valves. (Sheppard, col. 20, lines 18-19; Mian, col. 7, lines 40-45.) This list was obviously intended to show that all known valving principles, irrespective of function or equivalency, could be used in Mian's and Sheppard's devices without saying where, when, how and why a particular principle was suitable. Use of localized hydrophobic regions to effect a stop/start valving function is not disclosed by this extensive list of alternatives or elsewhere in Sheppard, Mian or Cathey.

All remaining claims are dependent claims of claim 22. If an independent claim is nonobvious, its dependent claims are nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

In view of the above, Applicants respectfully request that the rejection be withdrawn.

CONCLUSION

In view of the above, applicant believes the pending application is in condition for allowance. One month's extension request and fee are enclosed with this response. A Supplemental IDS with filing fee is also enclosed. Applicant believes no other fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2375, under Order No. HO-P02190US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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